

Serial No. 09/389,085
Attty. Docket No. UNM-480

REMARKS

Proposed new claims 30 through 49 substituted for pending claims 1 through 29 are presented here for consideration. Reconsideration, entry and allowance of all substitute claims are respectfully solicited.

In office action mailed September 16, 2003, the Examiner rejected certain of Applicant's claims as lacking novelty, pursuant to 35 USC § 102, in view of Tanaka (US Patent No. 5588065), and the Examiner rejected most of the remaining of Applicant's claims as obvious, pursuant to 35 USC § 103(a), in view of Tanaka, Tanaka in combination with Heirich et al. (U.S. Patent No. 5689574), Tanaka and Heirich in further combination with Hobelsberger (US Patent No. 5812686), and Tanaka and Heirich in further combination with Bertagni et al. (US Patent No. 5693917).

Applicant has amended all claims to better and more clearly claim the novel and unobvious elements of the invention and in order to further distinguish the invention over the prior art cited by the Examiner. As amended, the claimed invention is both novel and unobvious in view of Tanaka, Heirich, Hobelsberger, and Bertagni, whether alone or in combination with one another.

New independent claims 30 and 43 recite an audio apparatus and method having or utilizing an active and at least one passive radiator each sealed within openings in the walls of an otherwise fully enclosed speaker cabinet. Both active and passive radiators emit acoustic radiation symmetrically inward into the speaker cabinet and outward into

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the environment outside the cabinet. An acoustic sensor is suspended within the cabinet, in close proximity to the active radiator, capable of sensing the total acoustic radiation emitted from both radiators. A closed circuit feedback control system connects the acoustic sensor with the active radiator and functions to correct the signal input into the active radiator such that the total acoustic radiation approaches the intended input signal.

Tanaka teaches a bass reproduction speaker apparatus comprising an active speaker completely enclosed within a speaker cabinet, a passive radiator disposed within an opening in said speaker cabinet, a motional sensor affixed to the active speaker, and a feedback circuit for adjusting the output signal based upon speaker vibrations sensed by the motional sensor.

Tanaka does not teach an audio system having an active radiator sealed within a cabinet opening capable of radiating acoustic signals both inward into the cabinet and outward into the environment outside the cabinet. The ambient sound heard from the apparatus of Tanaka comes solely from sound generated by the passive radiator. As such, only low frequency radiation can be heard from the Tanaka audio system. In contrast, the audio system of the subject invention generates audible sound from both active and passive radiators as both active and passive radiators are mounted within cabinet openings. The active radiator generates both high frequency and low frequency acoustic radiation while the passive radiator generates only low frequency radiation.

Tanaka also does not teach an audio system having an acoustic sensor suspended within the cabinet in close proximity to the active radiator. Rather, Tanaka teaches a

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motional sensor that is affixed to the active radiator. Whereas the motional sensor of Tanaka can only sense physical vibrations generated by the active radiator, the acoustic sensor of the subject invention can sense the total acoustic radiation generated by both active and passive radiators. Moreover, sensing acoustic radiation is a more accurate method for correcting audio distortion through a closed-loop feedback control system than sensing physical speaker vibrations.

Like Tanaka, Hobelsberger teaches an audio system having an active radiator in combination with a passive radiator and sensor where the active radiator is enclosed entirely within a cabinet. Like Tanaka, no sound from the active radiator is emitted into the environment outside the speaker cabinet. Also like Tanaka, because the active radiator is inaccessible within the cabinet, the Hobelsberger apparatus is incapable of radiating high frequency acoustics. The system of Hobelsberger also differs from the audio system of the claimed invention in that the sensor of Hobelsberger is not suspended within the cabinet in close proximity to the active radiator to sense the total acoustic radiation from both radiators.

Hierich teaches an integral sound module having speakers mounted by means that isolate, or insulate, the speaker cabinet and other speaker from speaker vibrations. Hierich does not teach an audio system with a passive radiator, acoustic sensor, or feedback system.

Bertagni teaches a planar diaphragm loudspeaker. Bertagni does not teach an audio system having an active and passive radiator sealed within respective openings of

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an otherwise closed speaker cabinet. Bertagni also does not teach an acoustic sensor associated with the active radiator or a closed loop feedback control circuit that adjusts the audio output in response to acoustic radiation sensed by the sensor.

Claims 31 through 46 are dependent on and include all limitations of independent apparatus claim 30. Claims 48 and 49 are dependent on and include all limitations of independent method claim 47. Accordingly, for the reasons set forth above, claims 30 through 49 all recite a novel and unobvious invention and should be allowed.

CONCLUSION

In light of the amendments and remarks presented above, applicant submits that all claims currently pending in the application should be allowed and the application is now in condition for allowance.

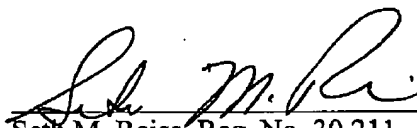
This Response is being faxed and mailed with a Petition to Revive Patent Abandoned Unintentionally Under 37 CFR 1.137(b) and applicable \$665 fee associated with the Petition. The number of total claims as amended are within the number of claims initially paid for. However, if there is any fee deficiency, authorization is hereby given to charge any such fee deficiency (small entity status claimed) to Deposit Account No. 501198.

The Examiner is invited to contact the undersigned attorney at (808) 523-8894, business hours Hawaii standard time, or via email at <sethreiss@lawhi.com> in order that

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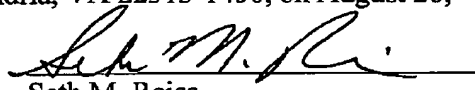
the undersigned attorney may endeavor to resolve any outstanding issues as expeditiously as possible thereby to avoid prolonged prosecution of the present application.

Respectfully submitted,


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CERTIFICATE OF MAILING

I hereby certify that this amendment and response is being deposited with the U.S. Postal Service with sufficient postage as first class mail addressed to Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 26, 2004.


Seth M. Reiss